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  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
FILE 'USPAT' ENTERED AT 09:00:07 ON 30 JUL 1999

  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  *         U. S.   P A T E N T   T E X T   F I L E             *
  *                                                             *
  *  THE WEEKLY PATENT TEXT AND IMAGE DATA IS CURRENT           *
  *  THROUGH July 27,1999                                       *
  *                                                             *
  *                                                             *
  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

=> s antigene

L1          104 ANTIGENE

=> s triplex

L2         1464 TRIPLEX

=> s hoogsteen

L3          220 HOOGSTEEN

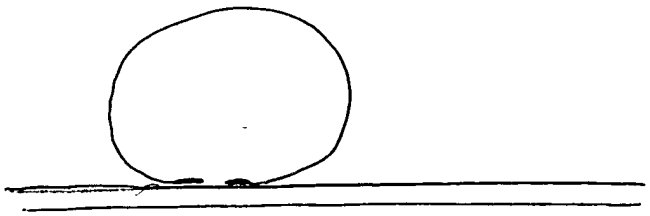
=> s transcription

L4        13774 TRANSCRIPTION

=> s l1 and l2 and l3 and l4

L5           13 L1 AND L2 AND L3 AND L4

=> d l5,bib,1-13
```



US PAT NO: 5,869,246 [IMAGE AVAILABLE] L5: 1 of 13
DATE ISSUED: Feb. 9, 1999
TITLE: **Triplex** Oligonucleotides targeted to p120
INVENTOR: Ken-ichi Matsuo, Saitama, Japan
Yoshikazu Sugimoto, Saitama, Japan
Norio Masuko, Saitama, Japan
Yuji Yamada, Saitama, Japan
ASSIGNEE: Taiho Pharmaceutical Co., Ltd., Tokyo, Japan (foreign corp.)
APPL-NO: 08/666,420
DATE FILED: Jun. 12, 1996
ART-UNIT: 165
PRIM-EXMR: John L. LeGuyader
LEGAL-REP: Sughrue, Mion, Zinn, Macpeak & Seas, PLLC

US PAT NO: 5,856,103 [IMAGE AVAILABLE] L5: 2 of 13
DATE ISSUED: Jan. 5, 1999
TITLE: Method for selectively ranking sequences for antisense targeting
INVENTOR: Donald M. Gray, Richardson, TX
Chris L. Clark, Plano, TX
ASSIGNEE: Board of Regents The University of Texas, Austin, TX (U.S. corp.)

APPL-NO: 08/808,47[redacted]
DATE FILED: Mar. 3, [redacted]
ART-UNIT: 164
PRIM-EXMR: Scott W. Houtteman
LEGAL-REP: Denise L. Mayfield

US PAT NO: 5,849,482 [IMAGE AVAILABLE] L5: 3 of 13
DATE ISSUED: Dec. 15, 1998
TITLE: Crosslinking oligonucleotides
INVENTOR: Rich B. Meyer, Jr., Bothell, WA
Howard B. Gamper, Woodinville, WA
Igor V. Kutyavin, Bothell, WA
Alexander A. Gall, Bothell, WA
Charles R. Petrie, Woodinville, WA
John C. Tabone, Bothell, WA
Gerald D. Hurst, The Woodlands, TX
ASSIGNEE: Epoch Pharmaceuticals, Inc., Bothell, WA (U.S. corp.)
APPL-NO: 08/485,611
DATE FILED: Jun. 7, 1995
ART-UNIT: 165
PRIM-EXMR: John L. LeGuyader
LEGAL-REP: Klein & Szekeres, LLP

US PAT NO: 5,739,308 [IMAGE AVAILABLE] L5: 4 of 13
DATE ISSUED: Apr. 14, 1998
TITLE: Integrated oligonucleotides
INVENTOR: Ekambar R. Kandimalla, Worcester, MA
Sudhir Agrawal, Shrewsbury, MA
ASSIGNEE: Hybridon, Inc., Cambridge, MA (U.S. corp.)
APPL-NO: 08/418,123
DATE FILED: Apr. 6, 1995
ART-UNIT: 189
PRIM-EXMR: George G. Elliott
ASST-EXMR: Andrew Wang
LEGAL-REP: McDonnell Boehnen Hulbert & Berghoff

US PAT NO: 5,714,323 [IMAGE AVAILABLE] L5: 5 of 13
DATE ISSUED: Feb. 3, 1998
TITLE: Over expression of single-stranded molecules
INVENTOR: Atushi Ohshima, Kyoto-fu, Japan
Sumiko Inouye, Bridgewater, NJ
Masayori Inouye, Bridgewater, NJ
ASSIGNEE: The University of Medecine and Dentistry of New Jersey, Newark, NJ (U.S. corp.)
APPL-NO: 08/318,867
DATE FILED: May 4, 1995
ART-UNIT: 187
PRIM-EXMR: Eggerton A. Campbell
LEGAL-REP: Weiser & Associates, P.C.

US PAT NO: 5,705,333 [IMAGE AVAILABLE] L5: 6 of 13
DATE ISSUED: Jan. 6, 1998
TITLE: Peptide-based nucleic acid mimics(PENAMS)
INVENTOR: Vibhakar J. Shah, San Francisco, CA
George L. Kenyon, San Francisco, CA
Irwin D. Kuntz, Greenbrae, CA
ASSIGNEE: The Regents of The University of California, Oakland, CA (U.S. corp.)
APPL-NO: 08/286,875
DATE FILED: Aug. 5, 1994
ART-UNIT: 189
PRIM-EXMR: Charles C.P. Rories

LEGAL-REP: Morrison oerster

US PAT NO: 5,696,253 [IMAGE AVAILABLE] L5: 7 of 13
DATE ISSUED: Dec. 9, 1997
TITLE: Polynucleoside chain with 3'.fwdarw.5' guanidyl linkages
INVENTOR: Thomas C. Bruice, Santa Barbara, CA
Robert O. Dempcy, Santa Barbara, CA
Orn Almarsson, Waterton, MA
ASSIGNEE: The Regents of the University of California, Oakland, CA (U.S. corp.)
APPL-NO: 08/268,859
DATE FILED: Jun. 30, 1994
ART-UNIT: 121
PRIM-EXMR: John Kight
ASST-EXMR: L. Eric Crane
LEGAL-REP: Merchant, Gould, Smith, Edell, Welter & Schmidt

US PAT NO: 5,693,773 [IMAGE AVAILABLE] L5: 8 of 13
DATE ISSUED: Dec. 2, 1997
TITLE: **Triplex**-forming antisense oligonucleotides having abasic linkers targeting nucleic acids comprising mixed sequences of purines and pyrimidines
INVENTOR: Ekambar Kandimalla, Worcester, MA
Sudhir Agrawal, Shrewsbury, MA
ASSIGNEE: Hybridon Incorporated, Cambridge, MA (U.S. corp.)
APPL-NO: 08/473,096
DATE FILED: Jun. 7, 1995
ART-UNIT: 187
PRIM-EXMR: W. Gary Jones
ASST-EXMR: Dianne Rees
LEGAL-REP: McDonnell Boehnen Hulbert & Berghoff

US PAT NO: 5,652,350 [IMAGE AVAILABLE] L5: 9 of 13
DATE ISSUED: Jul. 29, 1997
TITLE: Complementary DNA and toxins
INVENTOR: Kyoichi A. Watanabe, Port Chester, NY
Wu-Yun Ren, New Rochelle, NY
Roger Weil, Geneve, Switzerland
ASSIGNEE: Sloan-Kettering Institute for Cancer Research, New York, NY (U.S. corp.)
ZW Biomedical Research AG, Bern, Switzerland (foreign corp.)
APPL-NO: 08/484,138
DATE FILED: Jun. 7, 1995
ART-UNIT: 127
PRIM-EXMR: Nathan M. Nutter
LEGAL-REP: John P. White

US PAT NO: 5,641,625 [IMAGE AVAILABLE] L5: 10 of 13
DATE ISSUED: Jun. 24, 1997
TITLE: Cleaving double-stranded DNA with peptide nucleic acids
INVENTOR: David J. Ecker, Leucadia, CA
Ole Buchardt, Vaerlose, Denmark
Michael Egholm, Fredriksberg, Denmark
Peter E. Nielsen, Hjortevanget 509, DK 2980 Koddedal, Denmark
Rolf H. Berg, Rungsted Kyst, Denmark
Niels E. Mollegaard, Virum, Denmark
ASSIGNEE: ISIS Pharmaceuticals, Inc., Carlsbad, CA (U.S. corp.)
Peter E. Nielsen, Koddedal, Denmark (foreign indiv.)
APPL-NO: 08/088,658
DATE FILED: Jul. 2, 1993

ART-UNIT: 187
PRIM-EXMR: Scott W. tteman
LEGAL-REP: Woodcock Washburn Kurtz Mackiewicz & Norris

US PAT NO: 5,624,803 [IMAGE AVAILABLE] L5: 11 of 13
DATE ISSUED: Apr. 29, 1997
TITLE: In vivo oligonucleotide generator, and methods of testing the binding affinity of **triplex** forming oligonucleotides derived therefrom
INVENTOR: Sarah B. Noonberg, Berkeley, CA
C. Anthony Hunt, San Francisco, CA
ASSIGNEE: The Regents of the University of California, Oakland, CA (U.S. corp.)
APPL-NO: 08/324,001
DATE FILED: Oct. 13, 1994
ART-UNIT: 184
PRIM-EXMR: James Martinell

US PAT NO: 5,571,937 [IMAGE AVAILABLE] L5: 12 of 13
DATE ISSUED: Nov. 5, 1996
TITLE: Complementary DNA and toxins
INVENTOR: Kyoichi A. Watanabe, Port Chester, NY
Wu-Yun Ren, New Rochelle, NY
Roger Weil, Geneva, Switzerland
ASSIGNEE: Sloan-Kettering Institute for Cancer Research, New York, NY (U.S. corp.)
ZW Biomedical Research AG, Bern, Switzerland (foreign corp.)
APPL-NO: 08/242,664
DATE FILED: May 13, 1994
ART-UNIT: 127
PRIM-EXMR: Nathan M. Nutter
LEGAL-REP: John P. White

US PAT NO: 5,556,956 [IMAGE AVAILABLE] L5: 13 of 13
DATE ISSUED: Sep. 17, 1996
TITLE: Methods and compositions relating to the androgen receptor gene and uses thereof
INVENTOR: Arun K. Roy, San Antonio, TX
Bandana Chatterjee, San Antonio, TX
ASSIGNEE: Board of Regents, The University of Texas System, Austin, TX (U.S. corp.)
APPL-NO: 08/149,096
DATE FILED: Nov. 4, 1993
ART-UNIT: 185
PRIM-EXMR: Mindy Fleisher
ASST-EXMR: David Schmickel

09/[redacted]579
part of paper #10

Logging in to Dialog

Trying 9158046...Open

DIALOG INFORMATION SERVICES
PLEASE LOGON:
****
ENTER PASSWORD:
□khg0nkpf
****
Welcome to DIALOG

Dialog level 99.07.29D

Last logoff: 29jul99 16:09:53
Logon file405 30jul99 05:48:56
ANNOUNCEMENT **** ANNOUNCEMENT **** ANNOUNCEMENT
NEW
***Market Guide Company Financials (File 100)
***Frost & Sullivan Market Engineering (File 767)
***Canada Newswire (File 616 for current news, File 816 for archive)
***So America Bus Info (File 617 for current news, File 817
for archive news)
***UPI News (Files 261 for current news & 861 for archive news)
***Africa News (Files 606 for current news & 806 for archive news)
***ITAR/TASS (Files 607 for current news & 667 for archive news)
***Xinhua News (Files 618 for current news & 818 for archive news)
***Business Wire (Files 610 for current news & 810 for archive news)
***PR Newswire (Files 613 for current news & 813 for archive news)
***U.S. Newswire (Files 605 for current news & 665 for archive news)
***
RELOADED
***RAPRA (File 323)
***Gale Group New Product Announcements (File 621)
***Aerospace/Defense Markets & Technology (File 80)
***ICC British Company Directory (File 561)
□dialog
***

REMOVED
***Philosopher's Index (File 57)

>>> Enter BEGIN HOMEBASE for Dialog Announcements <<<
>>> of new databases, price changes, etc. <<<
SYSTEM:HOME
Menu System II: D2 version 1.7.8 term=ASCII
*** DIALOG HOMEBASE(SM) Main Menu ***

Information:
1. Announcements (new files, reloads, etc.)
2. Database, Rates, & Command Descriptions
3. Help in Choosing Databases for Your Topic
4. Customer Services (telephone assistance, training, seminars, etc.)
5. Product Descriptions

Connections:
6. DIALOG(R) Document Delivery
7. Data Star(R)

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/H = Help /L = Logoff /NOMENU = Command Mode

Enter an option number to view information or to connect to an online service. Enter a BEGIN command plus a file number to search a database (e.g., B1 for ERIC).
? b 410

>>Invalid Option Number

*** DIALOG HOMEBASE(SM) Main Menu ***

Information:
1. Announcements (new files, reloads, etc.)
2. Database, Rates, & Command Descriptions
3. Help in Choosing Databases for Your Topic
4. Customer Services (telephone assistance, training, seminars, etc.)
5. Product Descriptions

Connections:
6. DIALOG(R) Document Delivery
7. Data Star(R)

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/H = Help /L = Logoff /NOMENU = Command Mode

Enter an option number to view information or to connect to an online service. Enter a BEGIN command plus a file number to search a database (e.g., B1 for ERIC).
? set hi **;set hi**

30jul99 05:49:06 User242999 Session D9.1
$0.00 0.109 DialUnits FileHomeBase
$0.00 Estimated cost FileHomeBase
FTSNET 0.002 Hrs.
$0.00 Estimated cost this search
$0.00 Estimated total session cost 0.109 DialUnits

File 410:Chronolog(R) 1981-1999 Jul/Aug
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Set Items Description
--- ----- -----------

?
HILIGHT set on as ''
HILIGHT set on as ''
? b 5,6,55,154,155,156,312,399,biotech,biosci

30jul99 05:49:51 User242999 Session D9.2
$0.00 0.041 DialUnits File410
$0.00 Estimated cost File410
FTSNET 0.012 Hrs.
$0.00 Estimated cost this search
$0.00 Estimated total session cost 0.149 DialUnits

SYSTEM:OS - DIALOG OneSearch
File 5:Biosis Previews(R) 1969-1999/Jul W1
(c) 1999 BIOSIS
File 6:NTIS 64-1999/Aug W4
Comp&distr 1998 NTIS, Intl Copyright All Righ
File 55:Biosis Preiviews(R) 1993-1999/Jul W1
(c) 1999 BIOSIS

*File 55: File is reloaded. Accession number changed.
File 154:MEDLINE(R) 1993-1999/Sep W4
(c) format only 1999 Dialog Corporation
*File 154: reloaded, note accession numbers changed.
File 155:MEDLINE(R) 1966-1999/Sep W4
(c) format only 1999 Dialog Corporation
*File 155: reloaded, note accession numbers changed.
File 156:Toxline(R) 1965-1999/Jul
(c) format only 1999 The Dialog Corporation
File 312:CA SEARCH(R) 1987-1991
(c) 1997 American Chemical Society
*File 312: Use is subject to the terms of your user/customer agreement.
File 399:CA SEARCH(R) 1967-1999/UD=13105
(c) 1999 American Chemical Society
*File 399: Use is subject to the terms of your user/customer agreement.
RANK charge added; see HELP RATES 399.
File 8:Ei Compendex(R) 1970-1999/Jul W3
(c) 1999 Engineering Info. Inc.
File 34:SciSearch(R) Cited Ref Sci 1990-1999/Jul W4
(c) 1999 Inst for Sci Info
File 60:CRIS/USDA 1998/Sep
(c) format only 1998 The Dialog Corporaion pl
File 65:Inside Conferences 1993-1999/June W2
(c) 1999 BLDSC all rts. reserv.
File 71:ELSEVIER BIOBASE 1994-1999/Jun W3
(c) 1999 Elsevier Science B.V.
File 76:Life Sciences Collection 1982-1999/May
(c) 1999 Cambridge Sci Abs
File 94:JICST-EPlus 1985-1999/Apr W3
(c)1999 Japan Science and Tech Corp(JST)
File 98:General Sci Abs/Full-Text 1984-1999/Jun
(c) 1999 The HW Wilson Co.
File 99:Wilson Appl. Sci & Tech Abs 1983-1999/Jun
(c) 1999 The HW Wilson Co.
File 143:Biol. & Agric. Index 1983-1999/Jun
(c) 1999 The HW Wilson Co
File 144:PASCAL 1973-1999/JUN
(c) 1999 INIST/CNRS
File 266:FEDRIP 1999/May
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(c)1999 RoySocChm,DECHEMA,FizChemie
File 357:Derwent Biotechnology Abs 1982-1999/Jul B2
(c) 1999 Derwent Publ Ltd
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HELP DERWENT for details.
File 358:Current BioTech Abs 1983-1999/Aug
Royal Soc Chem & DECHEMA
File 370:Science 1996-1999/Jun W2
(c) 1999 AAAS
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
(c) 1998 Inst for Sci Info
File 35:Dissertation Abstracts Online 1861-1999/Jul
(c) 1999 UMI
File 40:Enviroline(R) 1975-1999/Jun
(c) 1999 Congressional Information Service
File 41:Pollution Abs 1970-1999/Aug
(c) 1999 Cambridge Scientific Abstracts
File 50:CAB Abstracts 1972-1999/Jun
(c) 1999 CAB International
File 68:Env.Bib. 1974-1999/Jun
(c) 1999 Internl Academy at Santa Barbara
File 91:MANTIS(TM) 1880-1999/Jun
1999 (c) Action Potential
File 110:WasteInfo 1974-May/99
(c) 1999 by AEA Technologies, plc

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  File 164:Allied & Alte[redacted]tive Medicine(AMED)  1984-199    n
        (c) 1999 BLHCIS
  File 172:EMBASE Alert  1999/Jul W1
        (c) 1999 Elsevier Science B.V.
  File 185:Zoological Record Online(R)  1978-1999/V135P28
        (c) 1999 BIOSIS
  File 467:ExtraMED(tm)  1998/Jun
        (c) 1998 Informania Ltd.

      Set  Items  Description
      ---  -----  -----------
? s transcription

      S1  946261  TRANSCRIPTION
? s inhibit?

Processing
Processed  10 of  36 files ...
Processing
Completed processing all files
      S2 5126897  INHIBIT?
? s (triplex(10w)form?) or (strand displace?) or catenat? or circular?

>>>File 5 processing for FORM? stopped at FORMYLSTEPHARINE
>>>File 312 processing for FORM? stopped at FORMYLPENTYLCYCLOHEXANE
>>>File 399 processing for FORM? stopped at FORMOSANSIS
Processing
Processing
Processed  10 of  36 files ...
Processing
>>>File 144 processing for FORM? stopped at FORMIDATUS
Processed  20 of  36 files ...
Processing
Completed processing all files
           8485  TRIPLEX
       10195077  FORM?
           3857  TRIPLEX(10W)FORM?
            163  STRAND DISPLACE?
           3664  CATENAT?
         369403  CIRCULAR?
      S3 376251  (TRIPLEX(10W)FORM?) OR (STRAND DISPLACE?) OR CATENAT? OR
                 CIRCULAR?
? s s1 and s2 and s3

         946261  S1
        5126897  S2
         376251  S3
      S4    1702  S1 AND S2 AND S3
? s s4 and oligonucleotide

           1702  S4
         158860  OLIGONUCLEOTIDE
      S5     482  S4 AND OLIGONUCLEOTIDE
? s s5 and target?

            482  S5
        1194548  TARGET?
      S6     331  S5 AND TARGET?
? duplicate remove

>>>'UPLICATE' not recognized as set or accession number
? remove duplicate

>>>Unrecognizable Command
? t his
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>>>'HIS' not recognized set or accession number
? d his

>>>'HIS' not recognized as set or accession number
? d history

>>>'HISTORY' not recognized as set or accession number
? s s6 and ligat?

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            331  S6
         157576  LIGAT?
      S7       3  S6 AND LIGAT?
? t s3/3/1-3
```

3/3/1 (Item 1 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

12004636 BIOSIS NO.: 199900285155
Long-distance navigation in sea turtles.

AUTHOR: Lohmann K J(a); Hester J T; Lohmann C M F(a)
AUTHOR ADDRESS: (a)Department of Biology, University of North Carolina, Chapel Hill, NC, 27599-3280, USA

JOURNAL: Ethology Ecology & Evolution 11 (1):p1-23 March, 1999
ISSN: 0394-9370
DOCUMENT TYPE: Literature Review
RECORD TYPE: Abstract
LANGUAGE: English
SUMMARY LANGUAGE: English

3/3/2 (Item 2 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

12004079 BIOSIS NO.: 199900284598
Genetic variation among strains of the toxic dinoflagellate Gymnodinium **catenatum** (Dinophyceae).

AUTHOR: Bolch Christopher J S(a); Blackburn Susan I; Hallegraeff Gustaaf M; Vaillancourt Rene E
AUTHOR ADDRESS: (a)School of Plant Science, University of Tasmania, Hobart, TAS, 7001, Australia

JOURNAL: Journal of Phycology 35 (2):p356-367 April, 1999
ISSN: 0022-3646
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English
SUMMARY LANGUAGE: English

3/3/3 (Item 3 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

12003805 BIOSIS NO.: 199900284324
Benthic foraminiferal distribution in the Mediterranean Sea.

AUTHOR: De Rijk S(a); Troelstra S R; Rohling E J
AUTHOR ADDRESS: (a)Laboratoire des Sciences du Climat et de l'Environnement, Laboratoire mixte CNRS-CEA, 4 avenue d, France

JOURNAL: Journal of For[redacted]iferal Research 29 (2):p93-10[redacted]pril, 1999
ISSN: 0096-1191
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English
SUMMARY LANGUAGE: English
? s triplex? or (strand displace?) or catenate or circularize

```
            9369  TRIPLEX?
             163  STRAND DISPLACE?
             413  CATENATE
             265  CIRCULARIZE
      S8   10205  TRIPLEX? OR (STRAND DISPLACE?) OR CATENATE OR CIRCULARIZE
? s s1 and s2 and s8

          946261  S1
         5126897  S2
           10205  S8
      S9     887  S1 AND S2 AND S8
? s s9 and oligonucleotide

             887  S9
          158860  OLIGONUCLEOTIDE
     S10     508  S9 AND OLIGONUCLEOTIDE
? s s10 and double stranded

             508  S10
              87  DOUBLE STRANDED
     S11       0  S10 AND DOUBLE STRANDED
? s s10 and double stranded target

             508  S10
               0  DOUBLE STRANDED TARGET
     S12       0  S10 AND DOUBLE STRANDED TARGET
? s s10 and partial? complementary

             508  S10
               0  PARTIAL? COMPLEMENTARY
     S13       0  S10 AND PARTIAL? COMPLEMENTARY
? d s10/3/1-5

      Display 10/3/1     (Item 1 from file: 5)
DIALOG(R)File   5:Biosis Previews(R)
(c) 1999 BIOSIS. All rts. reserv.
```

11935873 BIOSIS NO.: 199900181982
Triplex forming **oligonucleotide**-chlorambucil conjugates **inhibit** HER-2/neu **transcription** initiation.

AUTHOR: Clary E(a); Fortinberry H; Methvin R; Desouza N; Trent J; Gamper H; Ebbinghaus S W
AUTHOR ADDRESS: (a)Univ. Alabama Birmingham, Birmingham, AL 35294, USA

JOURNAL: Proceedings of the American Association for Cancer Research Annual Meeting 40p20 March, 1999

CONFERENCE/MEETING: 90th Annual Meeting of the American Association for Cancer Research Philadelphia, Pennsylvania, USA April 10-14, 1999
SPONSOR: American Association for Cancer Research

ISSN: 0197-016X

-more-

?

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DIALOG(R)File 5:Biosis Previews(R)
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RECORD TYPE: Citation
LANGUAGE: English

- end of record -

? t s10/3/1-5

10/3/1 (Item 1 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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11935873 BIOSIS NO.: 199900181982
Triplex forming **oligonucleotide**-chlorambucil conjugates **inhibit** HER-2/neu **transcription** initiation.

AUTHOR: Clary E(a); Fortinberry H; Methvin R; Desouza N; Trent J; Gamper H; Ebbinghaus S W
AUTHOR ADDRESS: (a)Univ. Alabama Birmingham, Birmingham, AL 35294, USA

JOURNAL: Proceedings of the American Association for Cancer Research Annual Meeting 40p20 March, 1999

CONFERENCE/MEETING: 90th Annual Meeting of the American Association for Cancer Research Philadelphia, Pennsylvania, USA April 10-14, 1999
SPONSOR: American Association for Cancer Research

ISSN: 0197-016X
RECORD TYPE: Citation
LANGUAGE: English

10/3/2 (Item 2 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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11840990 BIOSIS NO.: 199900087099
Inhibition of **transcription** elongation in the HER-2/neu coding sequence by **triplex**-directed covalent modification of the template strand.

AUTHOR: Ebbinghaus Scot W(a); Fortinberry Henry; Gamper Howard B Jr
AUTHOR ADDRESS: (a)Div. Hematol.-Oncol., Univ. Alabama at Birmingham, 520 Wallace Tumor Inst., 1824 Sixth Ave. S., , USA

JOURNAL: Biochemistry 38 (2):p619-628 Jan. 12, 1999
ISSN: 0006-2960
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

10/3/3 (Item 3 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
(c) 1999 BIOSIS. All rts. reserv.

11714529 BIOSIS NO.: 199800496260
DNA **triplex** formation on the granulocyte-macrophage colony-stimulating factor gene proximal promoter.

AUTHOR: Kochetkova Marina; Shannon M Frances(a)
AUTHOR ADDRESS: (a)Div. Hum. Immunol., Hanson Cent. Cancer Res., Inst. Med. Vet. Sci., Adelaide, P.O. Box 14 Rundle, Australia

JOURNAL: Nucleosides & Nucleotides 17 (9-11):p1801-1807 Sept.-Nov., 1998

ISSN: 0732-8311
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

10/3/4 (Item 4 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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11622398 BIOSIS NO.: 199800404519
An RNA **oligonucleotide** corresponding to the polypyrimidine region of the rat alpha1(I) procollagen promoter forms a stable **triplex** and **inhibits transcription.**

AUTHOR: Ririe Seth S; Guntaka Ramareddy V(a)
AUTHOR ADDRESS: (a)Dep. Mol. Microbiol. Immunol., Univ. Missouri-Columbia, Sch. Med., M610 Med. Sci. Build., Columb, USA

JOURNAL: Biochemical and Biophysical Research Communications 249 (1):p 218-221 Aug. 10, 1998
ISSN: 0006-291X
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

10/3/5 (Item 5 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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11386776 BIOSIS NO.: 199800168108
A novel **triplex**-forming **oligonucleotide** targeted to human cyclin D1 (bcl-1, proto-oncogene) promoter **inhibits transcription** in HeLa cells.

AUTHOR: Kim Hyung-Gyoon; Miller Donald M(a)
AUTHOR ADDRESS: (a)Dep. Biochem. Mol. Genet., Univ. Ala. Birm., Birmingham, AL 35294-0001, USA

JOURNAL: Biochemistry 37 (8):p2666-2672 Feb. 24, 1998
ISSN: 0006-2960
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

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? s s10 and catenat?

            508  S10
           3664  CATENAT?
     S14      1  S10 AND CATENAT?
? s s10 and catenat? or circular?

            508  S10
           3664  CATENAT?
         369403  CIRCULAR?
     S15 369403  S10 AND CATENAT? OR CIRCULAR?
? s s10 and (catenat? or circular?)

            508  S10
           3664  CATENAT?
         369403  CIRCULAR?
     S16     30  S10 AND (CATENAT? OR CIRCULAR?)
? t s16/3/1-30
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16/3/1 (Item 1 from file: 5)

DIALOG(R)File 5:Biosis Previews(R)
(c) 1999 BIOSIS. All rts. reserv.

10743128 BIOSIS NO.: 199799364273
A,G)-oligonucleotides form extraordinary stable triple helices with a critical R cntdot Y sequence of the murine c-Ki-ras promoter and **inhibit transcription** in transfected NIH 3T3 cells.

AUTHOR: Alunni-Fabbroni Marianna; Pirulli Doroti; Manzini Giorgio; Xodo Luigi E(a)
AUTHOR ADDRESS: (a)BBCM Dep., Univ. Trieste, Via Giorgieri 1, 34127 Trieste , Italy

JOURNAL: Biochemistry 35 (50):p16361-16369 1996
ISSN: 0006-2960
RECORD TYPE: Abstract
LANGUAGE: English

16/3/2 (Item 2 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
(c) 1999 BIOSIS. All rts. reserv.

10417334 BIOSIS NO.: 199699038479
Guanine-rich oligonucleotides targeted to a critical R cntdot Y site located in the Ki-ras promoter. The effect of competing self-structures on **triplex** formation.

AUTHOR: Alunni-Fabbroni Marianna; Manzini Giorgio; Quadrifoglio Franco; Xodo Luigi E(a)
AUTHOR ADDRESS: (a)Dep. Biochem. Biophysics Macromol. Chem., Univ. Trieste, Via Giorgieri 1, I-34127 Trieste, Italy

JOURNAL: European Journal of Biochemistry 238 (1):p143-151 1996
ISSN: 0014-2956
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

16/3/3 (Item 3 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
(c) 1999 BIOSIS. All rts. reserv.

08133302 BIOSIS NO.: 000093120450
INHIBITION OF **TRANSCRIPTION** OF HIV-1 IN INFECTED HUMAN CELLS BY OLIGODEOXYNUCLEOTIDES DESIGNED TO FORM DNA TRIPLE HELICES

AUTHOR: MCSHAN W M; ROSSEN R D; LAUGHTER A H; TRIAL J; KESSLER D J; ZENDEGUI J G; HOGAN M E; ORSON F M
AUTHOR ADDRESS: BUILDING 211, ROOM 226, VETERANS AFFAIRS MED. CENTER, 2002 HOLCOMBE BLVD., HOUSTON, TEXAS 77030.

JOURNAL: J BIOL CHEM 267 (8). 1992. 5712-5721.
FULL JOURNAL NAME: Journal of Biological Chemistry
CODEN: JBCHA
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

16/3/4 (Item 1 from file: 55)
DIALOG(R)File 55:Biosis Preiviews(R)
(c) 1999 BIOSIS. All rts. reserv.

10743128 BIOSIS NO.: 199799364273
A,G)-oligonucleotides form extraordinary stable triple helices with a

critical R cntdot Y sequence of the murine c-Ki-ras promoter and **inhibit transcription** in transfected NIH 3T3 cells.

AUTHOR: Alunni-Fabbroni Marianna; Pirulli Doroti; Manzini Giorgio; Xodo Luigi E(a)
AUTHOR ADDRESS: (a)BBCM Dep., Univ. Trieste, Via Giorgieri 1, 34127 Trieste , Italy

JOURNAL: Biochemistry 35 (50):p16361-16369 1996
ISSN: 0006-2960
RECORD TYPE: Abstract
LANGUAGE: English

16/3/5 (Item 2 from file: 55)
DIALOG(R)File 55:Biosis Preiviews(R)

10417334 BIOSIS NO.: 199699038479
Guanine-rich oligonucleotides targeted to a critical R cntdot Y site located in the Ki-ras promoter. The effect of competing self-structures on **triplex** formation.

AUTHOR: Alunni-Fabbroni Marianna; Manzini Giorgio; Quadrifoglio Franco; Xodo Luigi E(a)
AUTHOR ADDRESS: (a)Dep. Biochem. Biophysics Macromol. Chem., Univ. Trieste, Via Giorgieri 1, I-34127 Trieste, Italy

JOURNAL: European Journal of Biochemistry 238 (1):p143-151 1996
ISSN: 0014-2956
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

16/3/6 (Item 1 from file: 154)
DIALOG(R)File 154:MEDLINE(R)

09254086 97128654
A,G)-oligonucleotides form extraordinary stable triple helices with a critical R.Y sequence of the murine c-Ki-ras promoter and **inhibit transcription** in transfected NIH 3T3 cells.
Alunni-Fabbroni M; Pirulli D; Manzini G; Xodo LE
Department of Biochemistry, Biophysics, and Macromolecular Chemistry, University of Trieste, Italy.
Biochemistry (UNITED STATES) Dec 17 1996, 35 (50) p16361-9, ISSN 0006-2960 Journal Code: A0G
Languages: ENGLISH
Document type: JOURNAL ARTICLE

16/3/7 (Item 2 from file: 154)
DIALOG(R)File 154:MEDLINE(R)

08709039 96248432
Guanine-rich oligonucleotides targeted to a critical R . Y site located in the Ki-ras promoter. The effect of competing self-structures on **triplex** formation.
Alunni-Fabbroni M; Manzini G; Quadrifoglio F; Xodo LE
Department of Biochemistry, Biophysics and Macromolecular Chemistry, University of Trieste, Italy.
Eur J Biochem (GERMANY) May 15 1996, 238 (1) p143-51, ISSN 0014-2956 Journal Code: EMZ
Languages: ENGLISH

Document type: JOURNAL ARTICLE

16/3/8 (Item 1 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

09254086 97128654
A,G)-oligonucleotides form extraordinary stable triple helices with a critical R.Y sequence of the murine c-Ki-ras promoter and **inhibit transcription** in transfected NIH 3T3 cells.
Alunni-Fabbroni M; Pirulli D; Manzini G; Xodo LE
Department of Biochemistry, Biophysics, and Macromolecular Chemistry, University of Trieste, Italy.
Biochemistry (UNITED STATES) Dec 17 1996, 35 (50) p16361-9, ISSN 0006-2960 Journal Code: A0G
Languages: ENGLISH
Document type: JOURNAL ARTICLE

16/3/9 (Item 2 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

08709039 96248432
Guanine-rich oligonucleotides targeted to a critical R . Y site located in the Ki-ras promoter. The effect of competing self-structures on **triplex** formation.
Alunni-Fabbroni M; Manzini G; Quadrifoglio F; Xodo LE
Department of Biochemistry, Biophysics and Macromolecular Chemistry, University of Trieste, Italy.
Eur J Biochem (GERMANY) May 15 1996, 238 (1) p143-51, ISSN 0014-2956 Journal Code: EMZ
Languages: ENGLISH
Document type: JOURNAL ARTICLE

16/3/10 (Item 3 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

07030329 92184838
Inhibition of **transcription** of HIV-1 in infected human cells by oligodeoxynucleotides designed to form DNA triple helices.
McShan WM; Rossen RD; Laughter AH; Trial J; Kessler DJ; Zendegui JG; Hogan ME; Orson FM
Veterans Affairs Medical Center, Houston, Texas 77030.
J Biol Chem (UNITED STATES) Mar 15 1992, 267 (8) p5712-21, ISSN 0021-9258 Journal Code: HIV
Contract/Grant No.: AG07068; AI28071, AI, NIAID
Languages: ENGLISH
Document type: JOURNAL ARTICLE

dup

16/3/11 (Item 1 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

07378680 Genuine Article#: 158HH No. References: 61
Title: Formation of stable DNA triple helices within the human bcr promoter at a critical oligopurine target interrupted in the middle by two adjacent pyrimidines
Author(s): Xodo LE (REPRINT) ; Manzini G; Quadrifoglio F
Corporate Source: UNIV UDINE,SCH MED, DEPT BIOMED SCI & TECHNOL, VIA GERVASUTTA 48/I-33100 UDINE//ITALY/ (REPRINT); UNIV UDINE,SCH MED, DEPT BONE MARROW TRANSPLANTAT/I-33100 UDINE//ITALY/; UNIV

TRIESTE,DIPARTIMENT OCHIM BIOFIS & CHIM MACROMOL/ 127
TRIESTE//ITALY/
Journal: ANTISENSE & NUCLEIC ACID DRUG DEVELOPMENT, 1998, V8, N6 (DEC), P 477-488
ISSN: 1087-2906 Publication date: 19981200
Publisher: MARY ANN LIEBERT INC PUBL, 2 MADISON AVENUE, LARCHMONT, NY 10538
Language: English Document Type: ARTICLE (ABSTRACT AVAILABLE)

16/3/12 (Item 2 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 1999 Inst for Sci Info. All rts. reserv.

06833143 Genuine Article#: ZV426 No. References: 47
Title: Spectroscopic investigation of an intramolecular DNA **triplex** containing both G.G:C and T.A:T triads and its complex with netropsin
Author(s): Gondeau C; Maurizot JC; Durand M (REPRINT)
Corporate Source: UNIV ORLEANS,CTR BIOPHYS MOL, UPR 4301 CNRS, RUE CHARLES SADRON/F-45071 ORLEANS 2//FRANCE/ (REPRINT); UNIV ORLEANS,CTR BIOPHYS MOL, UPR 4301 CNRS/F-45071 ORLEANS 2//FRANCE/
Journal: JOURNAL OF BIOMOLECULAR STRUCTURE & DYNAMICS, 1998, V15, N6 (JUN), P1133-1145
ISSN: 0739-1102 Publication date: 19980600
Publisher: ADENINE PRESS INC, PO BOX 355/340, GUILDERLAND, NY 12084
Language: English Document Type: ARTICLE (ABSTRACT AVAILABLE)

16/3/13 (Item 3 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 1999 Inst for Sci Info. All rts. reserv.

06715185 Genuine Article#: ZM695 No. References: 31
Title: Probing the structure of DNA triple-stranded and parallel helices with chemical ligation method
Author(s): Dolinnaya NG (REPRINT) ; Kuchumov AR; Shabarova ZA
Corporate Source: MOSCOW MV LOMONOSOV STATE UNIV,FAC CHEM/MOSCOW 119899//RUSSIA/ (REPRINT)
Journal: MOLECULAR BIOLOGY, 1998, V32, N2 (MAR-APR), P273-279
ISSN: 0026-8933 Publication date: 19980300
Publisher: PLENUM PUBL CORP, CONSULTANTS BUREAU, 233 SPRING ST, NEW YORK, NY 10013
Language: English Document Type: ARTICLE (ABSTRACT AVAILABLE)

16/3/14 (Item 4 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 1999 Inst for Sci Info. All rts. reserv.

05657469 Genuine Article#: WN878 No. References: 24
Title: Use of fluorescein-labeled **oligonucleotide** for analysis of formation and dissociation kinetics of T:A:T triple-stranded DNA: Effect of divalent cations
Author(s): Ellouze C; Piot F; Takahashi M (REPRINT)
Corporate Source: CTR UNIV PARIS SUD,INST CURIE, GRP ETUD MUTAGENESE & CANCEROGENESE, UMR 216, BAT 110/F-91405 ORSAY//FRANCE/ (REPRINT); CTR UNIV PARIS SUD,INST CURIE, GRP ETUD MUTAGENESE & CANCEROGENESE, UMR 216/F-91405 ORSAY//FRANCE/; CNRS,/F-91405 ORSAY//FRANCE/
Journal: JOURNAL OF BIOCHEMISTRY, 1997, V121, N3 (MAR), P521-526
ISSN: 0021-924X Publication date: 19970300
Publisher: JAPANESE BIOCHEMICAL SOC, ISHIKAWA BLDG-3F, 25-16 HONGO-5-CHOME, BUNKYO-KU, TOKYO 113, JAPAN
Language: English Document Type: ARTICLE (ABSTRACT AVAILABLE)

16/3/15 (Item 5 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

05599702 Genuine Article#: WJ952 No. References: 91
Title: Design of **triplex**-forming oligonucleotides for binding DNA and RNA: Optimizing affinity and selectivity
Author(s): Kool ET (REPRINT)
Corporate Source: UNIV ROCHESTER,DEPT CHEM/ROCHESTER//NY/14627 (REPRINT)
Journal: NEW JOURNAL OF CHEMISTRY, 1997, V21, N1 (JAN), P33-45
ISSN: 1144-0546 Publication date: 19970100
Publisher: GAUTHIER-VILLARS, S P E S-JOURNAL DEPT, 120 BD ST GERMAIN, F-75006 PARIS, FRANCE
Language: English Document Type: ARTICLE (ABSTRACT AVAILABLE)

16/3/16 (Item 6 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

05450497 Genuine Article#: VZ905 No. References: 50
Title: MOLECULAR MODELING STUDY OF THE NETROPSIN COMPLEXATION WITH A NUCLEIC-ACID TRIPLE-HELIX
Author(s): VOVELLE F; PREVOST C; DURAND M; MAURIZOT JC
Corporate Source: CTR BIOPHYS MOL,RUE CHARLES SADRON/F-45071 ORLEANS 02//FRANCE/; UNIV ORLEANS/F-45071 ORLEANS 02//FRANCE/
Journal: JOURNAL OF BIOMOLECULAR STRUCTURE & DYNAMICS, 1996, V14, N3 (DEC), P293-302
ISSN: 0739-1102
Language: ENGLISH Document Type: ARTICLE (Abstract Available)

16/3/17 (Item 7 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

05439674 Genuine Article#: VY897 No. References: 56
Title: A,G)-OLIGONUCLEOTIDES FORM EXTRAORDINARY STABLE TRIPLE HELICES WITH A CRITICAL R-CENTER-DOT-Y SEQUENCE OF THE MURINE C-KI-RAS PROMOTER AND **INHIBIT TRANSCRIPTION** IN TRANSFECTED NIH 3T3 CELLS
Author(s): ALUNNIFABBRONI M; PIRULLI D; MANZINI G; XODO LE
Corporate Source: UNIV TRIESTE,DIPARTIMENTO BIOCHIM BIOFIS & CHIMMACROMOL,VIA GIORGIERI 1/I-34127 TRIESTE//ITALY/; UNIV TRIESTE,DIPARTIMENTO BIOCHIM BIOFIS & CHIMMACROMOL/I-34127 TRIESTE//ITALY/
Journal: BIOCHEMISTRY, 1996, V35, N50 (DEC 17), P16361-16369
ISSN: 0006-2960
Language: ENGLISH Document Type: ARTICLE (Abstract Available)

16/3/18 (Item 8 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

05429728 Genuine Article#: VY198 No. References: 50
Title: A NOVEL ACTIVITY OF HMG DOMAINS - PROMOTION OF THE TRIPLE-STRANDED COMPLEX-FORMATION BETWEEN DNA CONTAINING (GGA/TCC)(11) AND D(GGA)(11) OLIGONUCLEOTIDES
Author(s): SUDA T; MISHIMA Y; TAKAYANAGI K; ASAKURA H; ODANI S; KOMINAMI R
Corporate Source: NIIGATA UNIV,SCH MED,DEPT BIOCHEM 1,ASAHIMACHI DORI 1-757/NIIGATA 951//JAPAN/; NIIGATA UNIV,SCH MED,DEPT BIOCHEM 1/NIIGATA 951//JAPAN/; NIIGATA UNIV,SCH MED,DEPT INTERNAL MED 3/NIIGATA 951//JAPAN/; NIIGATA UNIV,FAC SCI,DEPT BIOL/NIIGATA 95021//JAPAN/
Journal: NUCLEIC ACIDS RESEARCH, 1996, V24, N23 (DEC 1), P4733-4740
ISSN: 0305-1048
Language: ENGLISH Document Type: ARTICLE (Abstract Available)

16/3/19 (Item 9 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
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05290781 Genuine Article#: VN238 No. References: 49
Title: STRUCTURAL SPECIFICITY EFFECTS OF TRIVALENT POLYAMINE ANALOGS ON THE STABILIZATION AND CONFORMATIONAL PLASTICITY OF **TRIPLEX** DNA
Author(s): THOMAS TJ; KULKARNI GD; GREENFIELD NJ; SHIRAHATA A; THOMAS T
Corporate Source: UNIV MED & DENT NEW JERSEY,ROBERT WOOD JOHNSON MED SCH,DEPT MED/NEW BRUNSWICK//NJ/08903; UNIV MED & DENT NEW JERSEY,ROBERT WOOD JOHNSON MED SCH,DEPT NEUROSCI & CELL BIOL/NEW BRUNSWICK//NJ/08903; UNIV MED & DENT NEW JERSEY,ROBERT WOOD JOHNSON MED SCH,DEPT COMMUNITY & ENVIRONM MED/NEW BRUNSWICK//NJ/08903; UNIV MED & DENT NEW JERSEY,ROBERT WOOD JOHNSON MED SCH,CLIN RES CTR/NEW BRUNSWICK//NJ/08903; UNIV MED & DENT NEW JERSEY,ROBERT WOOD JOHNSON MED SCH,ENVIRONM & OCCUPAT HLTH SCI INST/NEW BRUNSWICK//NJ/08903; UNIV MED & DENT NEW JERSEY,ROBERT WOOD JOHNSON MED SCH,INST CANC/NEW BRUNSWICK//NJ/08903; JOSAI UNIV,FAC PHARMACEUT SCI/SAKADO/SAITAMA 35002/JAPAN/
Journal: BIOCHEMICAL JOURNAL, 1996, V319, OCT (OCT 15), P591-599
ISSN: 0264-6021
Language: ENGLISH Document Type: ARTICLE (Abstract Available)

16/3/20 (Item 10 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 1999 Inst for Sci Info. All rts. reserv.

04940979 Genuine Article#: UU205 No. References: 56
Title: GUANINE-RICH OLIGONUCLEOTIDES TARGETED TO A CRITICAL R-CENTER-DOT-Y SITE LOCATED IN THE KI-RAS PROMOTER - THE EFFECT OF COMPETING SELF-STRUCTURES ON **TRIPLEX** FORMATION
Author(s): ALUNNIFABBRONI M; MANZINI G; QUADRIFOGLIO F; XODO LE
Corporate Source: UNIV TRIESTE,DEPT BIOCHEM BIOPHYS & MACROMOL CHEM,VIA GIORGIERI 1/I-34127 TRIESTE//ITALY/; UNIV TRIESTE,DEPT BIOCHEM BIOPHYS & MACROMOL CHEM/I-34127 TRIESTE//ITALY/; UNIV UDINE,DEPT BIOMED SCI & TECHNOL/UDINE//ITALY/
Journal: EUROPEAN JOURNAL OF BIOCHEMISTRY, 1996, V238, N1 (MAY), P143-151
ISSN: 0014-2956
Language: ENGLISH Document Type: ARTICLE (Abstract Available)

16/3/21 (Item 11 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 1999 Inst for Sci Info. All rts. reserv.

03214402 Genuine Article#: NM082 No. References: 65
Title: NUCLEIC-ACID ANALOGS WITH RESTRICTED CONFORMATIONAL FLEXIBILITY IN THE SUGAR-PHOSPHATE BACKBONE (BICYCLO-DNA) .3. SYNTHESIS, PAIRING PROPERTIES, AND CALORIMETRIC DETERMINATION OF DUPLEX AND **TRIPLEX** STABILITY OF DECANUCLEOTIDES FROM [(3'S,5'R)-2'-DEOXY-3',5'-ETHANO-BETA-D-RIBOFURANOSYL]ADENINE AND THYMINE
Author(s): TARKOY M; BOLLI M; LEUMANN C
Corporate Source: UNIV BERN,INST ORGAN CHEM,FREIESTR 3/CH-3012 BERN//SWITZERLAND/; UNIV BERN,INST ORGAN CHEM/CH-3012 BERN//SWITZERLAND/
Journal: HELVETICA CHIMICA ACTA, 1994, V77, N3, P716-744
ISSN: 0018-019X
Language: ENGLISH Document Type: ARTICLE (Abstract Available)

16/3/22 (Item 12 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 1999 Inst for Sci Info. All rts. reserv.

02806165 Genuine Article#: MF296 No. References: 24

Title: **OLIGONUCLEOTIDE** C[illegible]PS ARREST DNA-SYNTHESIS ON A SINGLE-STRANDED-DNA TARGET
Author(s): GIOVANNANGELI C; THUONG NT; HELENE C
Corporate Source: MUSEUM NATL HIST NAT,BIOPHYS LAB,CNRS,UNITE 481,INSERM,U201,43 RUE CUVIER/F-75231 PARIS 05//FRANCE/; CTR BIOPHYS MOLEC/F-45071 ORLEANS 02//FRANCE/
Journal: PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, 1993, V90, N21 (NOV 1), P10013-10017
ISSN: 0027-8424
Language: ENGLISH Document Type: ARTICLE (Abstract Available)

16/3/23 (Item 13 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 1999 Inst for Sci Info. All rts. reserv.

01557363 Genuine Article#: HH747 No. References: 57
Title: **INHIBITION** OF **TRANSCRIPTION** OF HIV-1 IN INFECTED HUMAN-CELLS BY OLIGODEOXYNUCLEOTIDES DESIGNED TO FORM DNA TRIPLE HELICES
Author(s): MCSHAN WM; ROSSEN RD; LAUGHTER AH; TRIAL J; KESSLER DJ; ZENDEGUI JG; HOGAN ME; ORSON FM
Corporate Source: VET AFFAIRS MED CTR,BLDG 211,RM 226,2002 HOLCOMBE BLVD/HOUSTON//TX/77030; TRIPLEX PHARMACEUT CORP/THE WOODLANDS//TX/77387 ; BAYLOR COLL MED,DEPT MED/HOUSTON//TX/77030; BAYLOR COLL MED,DEPT MICROBIOL & IMMUNOL/HOUSTON//TX/77030; BAYLOR COLL MED,CTR BIOTECHNOL/HOUSTON//TX/77030
Journal: JOURNAL OF BIOLOGICAL CHEMISTRY, 1992, V267, N8 (MAR 15), P 5712-5721
Language: ENGLISH Document Type: ARTICLE (Abstract Available)

16/3/24 (Item 1 from file: 71)
DIALOG(R)File 71:ELSEVIER BIOBASE
(c) 1999 Elsevier Science B.V. All rts. reserv.

00525760 97025572
A,G)-oligonucleotides form extraordinary stable triple helices with a critical R-Y sequence of the murine c-Ki-ras promoter and **inhibit transcription** in transfected NIH 3T3 cells
Alunni-Fabbroni M.; Pirulli D.; Manzini G.; Xodo L.E.
ADDRESS: L.E. Xodo, BBCM Department, University of Trieste, Via Giorgieri 1, 34127 Trieste, Italy
EMAIL: xodo@univ.trieste.it
Journal: Biochemistry, 35/50 (16361-16369), 1996, United States
PUBLICATION DATE: 19960000
CODEN: BICHA
ISSN: 0006-2960
DOCUMENT TYPE: Article
LANGUAGES: English SUMMARY LANGUAGES: English
NO. OF REFERENCES: 56

16/3/25 (Item 1 from file: 76)
DIALOG(R)File 76:Life Sciences Collection
(c) 1999 Cambridge Sci Abs. All rts. reserv.

02154284 4070168
A,G)-oligonucleotides form extraordinary stable triple helices with a critical R-Y sequence of the murine c-Ki-ras promoter and **inhibit transcription** in transfected NIH 3T3 cells
Alunni Fabbroni, M.; Pirulli, D.; Manzini, G.; Xodo, L.E.
BBCM Dep., Univ. Trieste, Via Giorgieri 1, 34127 Trieste, Italy
BIOCHEMISTRY (WASH.) vol. 35, no. 50, pp. 16361-16369 (1996)
ISSN: 0006-2960
DOCUMENT TYPE: Journal article LANGUAGE: ENGLISH

SUBFILE: Biochemistry Abstracts 2: Nucleic Acids

16/3/26 (Item 2 from file: 76)
DIALOG(R)File 76:Life Sciences Collection

02120964 4025620
Guanine-rich oligonucleotides targeted to a critical R - Y site located in the Ki-ras promoter. The effect of competing self-structures on **triplex** formation
Alunni Fabbroni, M.; Manzini, G.; Quadrifoglio, F.; Xodo, L.E.
Dep. Biochem., Biophys. and Macromolecular Chem., Univ. Trieste, Via Giorgieri 1, I-34127 Trieste, Italy
EUR. J. BIOCHEM. vol. 238, no. 1, pp. 143-151 (1996)
ISSN: 0014-2956
DOCUMENT TYPE: Journal article LANGUAGE: ENGLISH
SUBFILE: Biochemistry Abstracts 2: Nucleic Acids

16/3/27 (Item 1 from file: 98)
DIALOG(R)File 98:General Sci Abs/Full-Text

03546760 H.W. WILSON RECORD NUMBER: BGSI97046760 (USE FORMAT 7 FOR FULLTEXT)
Herpes simplex virus DNA replication.
Boehmer, Paul E
Lehman, I. R
Annual Review of Biochemistry (Annu Rev Biochem) v. 66 ('97) p. 347-84
SPECIAL FEATURES: bibl il ISSN: 0066-4154
LANGUAGE: English
COUNTRY OF PUBLICATION: United States
WORD COUNT: 17926

16/3/28 (Item 2 from file: 98)
DIALOG(R)File 98:General Sci Abs/Full-Text

03501698 H.W. WILSON RECORD NUMBER: BGSI97001698
A,G)-oligonucleotides form extraordinary stable triple helices with a critical R Y sequence of the murine c-Ki-ras promoter and **inhibit transcription** in transfected NIH 3T3 cells.
Alunni-Fabbroni, Marianna
Pirulli, Doroti; Manzini, Giorgio
Biochemistry (American Chemical Society) (Biochemistry) v. 35 (Dec. 17 '96) p. 16361-9
DOCUMENT TYPE: Feature Article
SPECIAL FEATURES: bibl il ISSN: 0006-2960
LANGUAGE: English
COUNTRY OF PUBLICATION: United States

16/3/29 (Item 3 from file: 98)
DIALOG(R)File 98:General Sci Abs/Full-Text

03253318 H.W. WILSON RECORD NUMBER: BGSI96003318 (USE FORMAT 7 FOR FULLTEXT)
Homologous recombination proteins in prokaryotes and eukaryotes.
Camerini-Otero, R. Daniel
Hsieh, Peggy
Annual Review of Genetics (Annu Rev Genet) v. 29 ('95) p. 509-52
SPECIAL FEATURES: bibl il ISSN: 0066-4197
LANGUAGE: English

COUNTRY OF PUBLICATION: ted States
WORD COUNT: 20995

16/3/30 (Item 1 from file: 35)
DIALOG(R)File 35:Dissertation Abstracts Online

01586964 ORDER NO: AADNN-19779
SYNTHESIS AND STUDIES ON BRANCHED AND 2',5'-LINKED OLIGONUCLEOTIDES (TRIPLE HELIX, IMMUNE DEFICIENCY, HIV-1)
Author: UDDIN, ANDRE HAMEED
Degree: PH.D.
Year: 1996
Corporate Source/Institution: MCGILL UNIVERSITY (CANADA) (0781)
Source: VOLUME 58/06-B OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 3026. 179 PAGES

09/029579

1/3/1 (Item 1 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

11022990 BIOSIS NO.: 199799644135
Padlock probes reveal single-nucleotide differences, parent of origin and in situ distribution of centromeric sequences in human chromosomes 13 and 21.

AUTHOR: Nilsson Mats(a); Krejci Katerina; Koch Jorn; Kwiatkowski Marek; Gustavsson Peter; Landegren Ulf
AUTHOR ADDRESS: (a)Beijer Lab., Dep. Med. Genetics, Biomedical Centre, Box 589, S-75123 Uppsala, Sweden

JOURNAL: Nature Genetics 16 (3):p252-255 1997
ISSN: 1061-4036
RECORD TYPE: Abstract
LANGUAGE: English

1/3/2 (Item 2 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

09536568 BIOSIS NO.: 199497544938
Padlock Probes: Circularizing **Oligonucleotides** for Localized DNA Detection.

AUTHOR: Nilsson Mats; Malmgren Helena; Samiotaki Martina; Kwiatkowski Marek ; Chowdhary Bhanu P; Landegren Ulf(a)
AUTHOR ADDRESS: (a)Beijer Lab., Dep. Med. Genet., Box 589, Biomed. Cent., S-75123 Uppsala, Sweden

JOURNAL: Science (Washington D C) 265 (5181):p2085-2088 1994
ISSN: 0036-8075
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

1/3/3 (Item 1 from file: 55)
DIALOG(R)File 55:Biosis Preiviews(R)

11022990 BIOSIS NO.: 199799644135
Padlock probes reveal single-nucleotide differences, parent of origin and in situ distribution of centromeric sequences in human chromosomes 13 and 21.

AUTHOR: Nilsson Mats(a); Krejci Katerina; Koch Jorn; Kwiatkowski Marek; Gustavsson Peter; Landegren Ulf
AUTHOR ADDRESS: (a)Beijer Lab., Dep. Med. Genetics, Biomedical Centre, Box 589, S-75123 Uppsala, Sweden

JOURNAL: Nature Genetics 16 (3):p252-255 1997
ISSN: 1061-4036
RECORD TYPE: Abstract
LANGUAGE: English

1/3/4 (Item 2 from file: 55)
DIALOG(R)File 55:Biosis Previews(R)
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09536568 BIOSIS NO.: 199497544938
Padlock Probes: Circularizing **Oligonucleotides** for Localized DNA Detection.

AUTHOR: Nilsson Mats; Malmgren Helena; Samiotaki Martina; Kwiatkowski Marek ; Chowdhary Bhanu P; Landegren Ulf(a)
AUTHOR ADDRESS: (a)Beijer Lab., Dep. Med. Genet., Box 589, Biomed. Cent., S-75123 Uppsala, Sweden

JOURNAL: Science (Washington D C) 265 (5181):p2085-2088 1994
ISSN: 0036-8075
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

1/3/5 (Item 1 from file: 154)
DIALOG(R)File 154:MEDLINE(R)
(c) format only 1999 Dialog Corporation. All rts. reserv.

08191902 94378005
Padlock probes: circularizing **oligonucleotides** for localized DNA detection.
Nilsson M; Malmgren H; Samiotaki M; Kwiatkowski M; Chowdhary BP; Landegren U
Beijer Laboratory, Department of Medical Genetics, Biomedical Center, Uppsala, Sweden.
Science (UNITED STATES) Sep 30 1994, 265 (5181) p2085-8, ISSN 0036-8075 Journal Code:. UJ7
Languages: ENGLISH
Document type: JOURNAL ARTICLE

1/3/6 (Item 1 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 1999 Dialog Corporation. All rts. reserv.

08191902 94378005
Padlock probes: circularizing **oligonucleotides** for localized DNA detection.
Nilsson M; Malmgren H; Samiotaki M; Kwiatkowski M; Chowdhary BP; Landegren U
Beijer Laboratory, Department of Medical Genetics, Biomedical Center, Uppsala, Sweden.
Science (UNITED STATES) Sep 30 1994, 265 (5181) p2085-8, ISSN 0036-8075 Journal Code: UJ7
Languages: ENGLISH
Document type: JOURNAL ARTICLE

1/3/7 (Item 1 from file: 399)
DIALOG(R)File 399:CA SEARCH(R)
(c) 1999 American Chemical Society. All rts. reserv.

126282783 CA: 126(21)282783b PATENT
Methods and compositions for nucleic acid targeting
INVENTOR(AUTHOR): Landegren, Ulf
LOCATION: Swed.
ASSIGNEE: Landegren, Ulf
PATENT: PCT International ; WO 9709069 A1 DATE: 19970313
APPLICATION: WO 96SE1119 (19960906) *SE 953117 (19950908)
PAGES: 13 pp. CODEN: PIXXD2 LANGUAGE: English CLASS: A61K-048/00A;

C12Q-001/68B DESIGNAT[redacted]COUNTRIES: AL; AM; AT; AU; AZ; [redacted]; BG; BR; BY; CA; CH; CN; CZ; DE; DK; EE; [redacted]ES; FI; GB; GE; HU; IL; IS; JP; [redacted]; KG; KP; KR; KZ; LK; LR; LS; LT; LU; LV; MD; MG; MK; MN; MW; MX; NO; NZ; PL; PT; RO; RU; SD; SE; SG; SI; SK; TJ; TM; TR; TT; UA; UG; US; UZ; VN; AM; AZ; BY; KG; KZ; MD; RU; TJ; TM DESIGNATED REGIONAL: KE; LS; MW; SD; SZ; UG; AT; BE; CH; DE; DK ; ES; FI; FR; GB; GR; IE; IT; LU; MC; NL; PT; SE; BF; BJ; CF; CG; CI; CM; GA

1/3/8 (Item 2 from file: 399)
DIALOG(R)File 399:CA SEARCH(R)

121247363 CA: 121(21)247363q JOURNAL
Padlock probes: circularizing oligonucleotides for localized DNA detection
AUTHOR(S): Nilsson, Mats; Malmgren, Helena; Samiotaki, Martina; Kwiatkowski, Marek; Chowdhary, Bhanu P.; Landegen, Ulf
LOCATION: Dep. Medical Genetics, The Beijer Laboratory, S-75123, Uppsala, Swed.
JOURNAL: Science (Washington, D. C.) DATE: 1994 VOLUME: 265 NUMBER: 5181 PAGES: 2085-8 CODEN: SCIEAS ISSN: 0036-8075 LANGUAGE: English

1/3/9 (Item 1 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

07427758 Genuine Article#: 164DG No. References: 33
Title: Accessing genomic information: alternatives to PCR
Author(s): Isaksson A (REPRINT) ; Landegren U
Corporate Source: UPPSALA BIOMED CTR,BEIJER LAB, DEPT GENET & PATHOL, BOX 589/SE-75123 UPPSALA//SWEDEN/ (REPRINT)
Journal: CURRENT OPINION IN BIOTECHNOLOGY, 1999, V10, N1 (FEB), P11-15
ISSN: 0958-1669 Publication date: 19990200
Publisher: CURRENT BIOLOGY LTD, 34-42 CLEVELAND STREET, LONDON W1P 6LB, ENGLAND
Language: English Document Type: REVIEW (ABSTRACT AVAILABLE)

1/3/10 (Item 2 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

07157040 Genuine Article#: 130KF No. References: 39
Title: Sensitive mRNA detection by fluorescence in situ hybridization using horseradish peroxidase-labeled oligodeoxynucleotides and tyramide signal amplification
Author(s): vandeCorput MPC; Dirks RW; vanGijlswijk RPM; vanBinnendijk E; Hattinger CM; dePaus RA; Landegent JE; Raap AK (REPRINT)
Corporate Source: LEIDEN UNIV,MED CTR, DEPT MOL CELL BIOL, LAB CYTOCHEM & CYTOMETRY, WASSENAARSEWEG 72/NL-2333 AL LEIDEN//NETHERLANDS/ (REPRINT); LEIDEN UNIV,MED CTR, DEPT MOL CELL BIOL, LAB CYTOCHEM & CYTOMETRY/NL-2333 AL LEIDEN//NETHERLANDS/; LEIDEN UNIV,MED CTR, DEPT HAEMATOL, LAB EXPT HAEMATOL/NL-2333 AL LEIDEN//NETHERLANDS/
Journal: JOURNAL OF HISTOCHEMISTRY & CYTOCHEMISTRY, 1998, V46, N11 (NOV), P 1249-1259
ISSN: 0022-1554 Publication date: 19981100
Publisher: HISTOCHEMICAL SOC INC, UNIV WASHINGTON, DEPT BIOSTRUCTURE, BOX 357420, SEATTLE, WA 98195
Language: English Document Type: ARTICLE (ABSTRACT AVAILABLE)

1/3/11 (Item 3 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

03512057 Genuine Article#: PJ912 No. References: 16
Title: **PADLOCK** PROBES - CIRCULARIZING **OLIGONUCLEOTIDES** FOR LOCALIZED DNA DETECTION
Author(s): NILSSON M; MALMGREN H; SAMIOTAKI M; KWIATKOWSKI M; CHOWDHARY BP; LANDEGREN U
Corporate Source: BIOMED CTR,DEPT MED GENET,BEIJER LAB,BOX 589/S-75123 UPPSALA//SWEDEN/; BIOMED CTR,DEPT MED GENET,BEIJER LAB/S-75123 UPPSALA//SWEDEN/; SWEDISH UNIV AGR SCI,DEPT ANIM BREEDING & GENET/S-75007 UPPSALA//SWEDEN/
Journal: SCIENCE, 1994, V265, N5181 (SEP 30), P2085-2088
ISSN: 0036-8075
Language: ENGLISH Document Type: ARTICLE (Abstract Available)

1/3/12 (Item 1 from file: 65)
DIALOG(R)File 65:Inside Conferences
(c) 1999 BLDSC all rts. reserv. All rts. reserv.

00979250 INSIDE CONFERENCE ITEM ID: CN009566983
Padlock probes-**Oligonucleotides** for in situ detection
Nilsson, M.; Kwiatkowski, M.; Landegren, U.
CONFERENCE: Genome mapping and sequencing-Meeting
ABSTRACTS OF PAPERS PRESENTED AT THE MEETING ON GENOME MAPPING AND SEQUENCING, 1995 P: 230
CSH, 1995
LANGUAGE: English DOCUMENT TYPE: Conference Abstracts and programme
CONFERENCE SPONSOR: Cold Spring Harbor Laboratory
CONFERENCE LOCATION: Cold Spring Harbor, NY
CONFERENCE DATE: May 1995 (199505) (199505)

1/3/13 (Item 1 from file: 71)
DIALOG(R)File 71:ELSEVIER BIOBASE
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00640574 97147335
Padlock probes reveal single-nucleotide differences, parent of origin and in situ distribution of centromeric sequences in human chromosomes 13 and 21
Nilsson M.; Krejci K.; Koch J.; Kwiatkowski M.; Gustavsson P.; Landegren U.
ADDRESS: M. Nilsson, Beijer Laboratory, Department of Medical Genetics, Biomedical Centre, S-75123 Uppsala, Sweden
Journal: Nature Genetics, 16/3 (252-255), 1997, United States
PUBLICATION DATE: 19970000
CODEN: NGENE
ISSN: 1061-4036
DOCUMENT TYPE: Article
LANGUAGES: English SUMMARY LANGUAGES: English
NO. OF REFERENCES: 25

1/3/14 (Item 2 from file: 71)
DIALOG(R)File 71:ELSEVIER BIOBASE
(c) 1999 Elsevier Science B.V. All rts. reserv.

00162434 94150767
Padlock probes: Circularizing **oligonucleotides** for localized DNA detection
Nilsson M.; Malmgren H.; Samiotaki M.; Kwiatkowski M.; Chowdhary B.P.; Landegren U.
ADDRESS: U. Landegren, Beijer Laboratory, Department of Medical Genetics, Biomedical Center, Box 589, S-75123 Uppsala, Sweden
Journal: Science, 265/5181 (2085-2088), 1994, United States
PUBLICATION DATE: 19940000
CODEN: SCIEA

ISSN: 0036-8075
DOCUMENT TYPE: Article
LANGUAGES: English SUMMARY LANGUAGES: English

1/3/15 (Item 1 from file: 76)
DIALOG(R)File 76:Life Sciences Collection

02174925 4097407
FISH with a twist
Lizardi, P.M.; Ward, D.C.
Dep. Genet., Yale Univ. Sch. Med., New Haven, CT 06510, USA
NAT. GENET. vol. 16, no. 3, pp. 217-218 (1997)
ISSN: 1061-4036
DOCUMENT TYPE: Journal article LANGUAGE: ENGLISH
SUBFILE: Genetics Abstracts

1/3/16 (Item 2 from file: 76)
DIALOG(R)File 76:Life Sciences Collection

02172023 4093842
Padlock probes reveal single-nucleotide differences, parent of origin and in situ distribution of centromeric sequences in human chromosomes 13 and 21
Nilsson, M.; Krejci, K.; Koch, J.; Kwiatkowski, M.; Gustavsson, P.; Landegren, U.
Beijer Laboratory, Department of Medical Genetics, Biomedical Centre, Box 589, S-75123 Uppsala, Sweden
NAT. GENET. vol. 16, no. 3, pp. 252-255 (1997)
ISSN: 1061-4036
DOCUMENT TYPE: Journal article LANGUAGE: ENGLISH
SUBFILE: Genetics Abstracts

1/3/17 (Item 3 from file: 76)
DIALOG(R)File 76:Life Sciences Collection

01836989 3624856
Padlock probes: Circularizing **oligonucleotides** for localized DNA detection
Nilsson, M.; Malmgren, H.; Samiotaki, M.; Kwiatkowski, M.; Chowdhary, B.P.; Landegren, U.
Beijer Lab., Dep. Med. Genet., Box 589, Biomedical Cent., S-75123 Uppsala, Sweden
SCIENCE (WASH.) vol. 265, no. 5181, pp. 2085-2088 (1994)
ISSN: 0036-8075
DOCUMENT TYPE: Journal article LANGUAGE: ENGLISH
SUBFILE: Biochemistry Abstracts 2: Nucleic Acids; Human Genome Abstracts; Medical and Pharmaceutical Biotechnology Abstracts

1/3/18 (Item 1 from file: 94)
DIALOG(R)File 94:JICST-EPlus

02793176 JICST ACCESSION NUMBER: 96A0624494 FILE SEGMENT: JICST-E
Research and Development on High Efficient DNA Mapping Technique.
YAMAMOTO TAKEKAZU (1); FUJIWARA JUN (1); SAKAGUCHI KENJI (1); SHIGEMORI YASUSHI (1)
(1) Aishinkosumosuken
Baiotekunoroji Shinpojiumu Yokoshu, 1995, VOL.13th, PAGE.179-184, FIG.11, TBL.1, REF.6

JOURNAL NUMBER: L0180[redacted]
UNIVERSAL DECIMAL CLASSIFICATION: 575.116.4 575.113.0[redacted]
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Conference Proceeding
ARTICLE TYPE: Short Communication
MEDIA TYPE: Printed Publication

1/3/19 (Item 1 from file: 98)
DIALOG(R)File 98:General Sci Abs/Full-Text
(c) 1999 The HW Wilson Co. All rts. reserv.

02792652 H.W. WILSON RECORD NUMBER: BGSI94042652
Padlock probes: circularizing **oligonucleotides** for localized DNA detection.
Nilsson, Mats
Malmgren, Helena; Samiotaki, Martina
Science (Science) v. 265 (Sept. 30 '94) p. 2085-8
SPECIAL FEATURES: bibl il ISSN: 0036-8075
LANGUAGE: English
COUNTRY OF PUBLICATION: United States

1/3/20 (Item 1 from file: 99)
DIALOG(R)File 99:Wilson Appl. Sci & Tech Abs
(c) 1999 The HW Wilson Co. All rts. reserv.

1191724 H.W. WILSON RECORD NUMBER: BAST94060368
Padlock probes: circularizing **oligonucleotides** for localized DNA detection
Nilsson, Mats; Malmgren, Helena; Samiotaki, Martina
Science v. 265 (Sept. 30 '94) p. 2085-8
DOCUMENT TYPE: Feature Article ISSN: 0036-8075

1/3/21 (Item 1 from file: 357)
DIALOG(R)File 357:Derwent Biotechnology Abs
(c) 1999 Derwent Publ Ltd. All rts. reserv.

0227180 DBA Accession No.: 98-08777
Locked on target: strategies for future gene diagnostics - construction of circular, padlock DNA probe
AUTHOR: Landegren U; Nilsson M
CORPORATE AFFILIATE: Univ.Uppsala
CORPORATE SOURCE: Department of Medical Genetics, PO Box 589, Uppsala Biomedical Center, S-751 23 Uppsala, Sweden.
email:ulf.landegren@medgen.uu.se
JOURNAL: Ann.Med.(Helsinki) (29, 6, 585-90) 1997
ISSN: 0003-4819 CODEN: ANMDEU
LANGUAGE: English

1/3/22 (Item 2 from file: 357)
DIALOG(R)File 357:Derwent Biotechnology Abs
(c) 1999 Derwent Publ Ltd. All rts. reserv.

0210921 DBA Accession No.: 97-06042 PATENT
Targeting of double stranded nucleic acids - double stranded plasmid DNA targeting using **padlock oligonucleotide** DNA probe for in vivo gene manipulation and genetic disorder therapy
AUTHOR: Landegren U
CORPORATE SOURCE: Uppsala, Sweden.
PATENT ASSIGNEE: Landegren U 1997
PATENT NUMBER: WO 9709069 PATENT DATE: 970313 WPI ACCESSION NO.: 97-192656 (9717)
PRIORITY APPLIC. NO.: SE 953117 APPLIC. DATE: 950908

NATIONAL APPLIC. NO.: [redacted]96SE1119 APPLIC. DATE: 960906
LANGUAGE: English

1/3/23 (Item 3 from file: 357)
DIALOG(R)File 357:Derwent Biotechnology Abs

0171326 DBA Accession No.: 94-13877
Padlock probes: circularizing **oligonucleotides** for localized DNA detection - construction of padlock probe comprising circularizable DNA probe
AUTHOR: Nilsson M; Malmgren H; Samiotaki M; Kwiatkowski M; Chowdhary B P; +Landegren U
CORPORATE AFFILIATE: Beijer-Lab. Univ.Swedish-Agr.Sci.
CORPORATE SOURCE: The Beijer Laboratory, Department of Medical Genetics, Box 589 Biomedical Center, S-75123 Uppsala, Sweden.
JOURNAL: Science (265, 5181, 2085-88) 1994
CODEN: SCIEAS
LANGUAGE: English

1/3/24 (Item 1 from file: 35)
DIALOG(R)File 35:Dissertation Abstracts Online

01654450 ORDER NO: NOT AVAILABLE FROM UNIVERSITY MICROFILMS INT'L.
PADLOCK PROBES: CIRCULARIZING **OLIGONUCLEOTIDES** FOR LOCALIZED DETECTION OF DNA SEQUENCE VARIANTS
Author: NILSSON, MATS
Degree: FIL.DR
Year: 1998
Corporate Source/Institution: UPPSALA UNIVERSITET (SWEDEN) (0903)
Source: VOLUME 59/04-C OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 877. 50 PAGES
ISBN: 91-554-4205-6
Publisher: UPPSALA UNIVERSITY LIBRARY, BOX 510, SE-751 20 UPPSALA,

09 029579

```
=> s padlock oligonucleotide

          3368 PADLOCK
         12819 OLIGONUCLEOTIDE
L3           0 PADLOCK OLIGONUCLEOTIDE
                 (PADLOCK(W)OLIGONUCLEOTIDE)

=> s transcription

L4       13774 TRANSCRIPTION

=> s inhibit?

L5      275860 INHIBIT?

=> s l3 and l4

L6           0 L3 AND L4

=> s triplex

L7        1464 TRIPLEX

=> s l6 and  l3

L8           0 L6 AND  L3

=> s oligonucleotide

L9       12819 OLIGONUCLEOTIDE

=> s triplex or strand displace?

          1464 TRIPLEX
         39641 STRAND
        410217 DISPLACE?
           322 STRAND DISPLACE?
                 (STRAND(W)DISPLACE?)
L10       1748 TRIPLEX OR STRAND DISPLACE?

=> s l4 and l9 and l10

L11        695 L4 AND L9 AND L10

=> s l11 and inhibit?

        275860 INHIBIT?
L12        625 L11 AND INHIBIT?

=> remove duplicates

'DUPLICATES' IS NOT VALID HERE

=> duplicate remove

'DUPLICATE' IS NOT A RECOGNIZED COMMAND

=> s l12 and catenat?

           366 CATENAT?
```

```
L13          1 L12 AND C[redacted]NAT?

=> s l12 and circulari?

          2922 CIRCULARI?
L14        236 L12 AND CIRCULARI?

=> s l14 and promoter

         27773 PROMOTER
L15        228 L14 AND PROMOTER

=> s l14 and promoter targeting

         27773 PROMOTER
          7060 TARGETING
             1 PROMOTER TARGETING
                 (PROMOTER(W)TARGETING)
L16          0 L14 AND PROMOTER TARGETING

=> d l13,al

'AL' IS NOT A VALID FORMAT FOR FILE 'USPAT'
ENTER DISPLAY FORMAT (CIT):

ENTER DISPLAY FORMAT (CIT):end


=> d l13,all


5,876,924 [IMAGE AVAILABLE]   Mar. 2, 1999            L13: 1 of 1
  Nucleic acid amplification method hybridization signal amplification
                              method (HSAM)

INVENTOR:       David Y. Zhang, Jamaica, NY
                Margaret Brandwein, Jamaica Estates, NY
ASSIGNEE:       Mount Sinai School of Medicine, New York, NY (U.S. corp.)
APPL-NO:        08/690,495
DATE FILED:     Jul. 31, 1996
REL-US-DATA:    Continuation-in-part of Ser. No. 596,331, May 20, 1996,
                  which is a continuation-in-part of Ser. No. 263,937,
                  Jun. 22, 1994, abandoned.
INT-CL:         [6] C12Q 1/68; C12Q 1/70; C07H 21/02; C07H 21/04
US-CL-ISSUED:   435/5, 6, 7.1, 7.5, 7.9, 91.2; 536/23.1, 24.3, 24.32,
                  24.33
US-CL-CURRENT:  435/5, 6, 7.1, 7.5, 7.9, 91.2; 536/23.1, 24.3, 24.32,
                  24.33
SEARCH-FLD:     435/6, 5, 7.1, 7.9, 91.2, 7.5; 536/23.1, 24.3, 24.32,
                  24.33
REF-CITED:
                              U.S. PATENT DOCUMENTS
     4,786,600   11/1988   Kramer et al.
     4,925,785    5/1990   Wang
     4,957,858    9/1990   Chu et al.
     4,988,617    1/1991   Landegren
     5,112,734    5/1992   Kramer et al.
     5,118,605    6/1992   Urdea
     5,118,801    6/1992   Lizardi et al.
     5,200,314    4/1993   Urdea
     5,312,728    5/1994   Lizardi et al.
     5,407,798    4/1995   Martinelli et al.
     5,462,852   10/1995   Arthur et al.                    435/5
     5,523,204    6/1996   Singer et al.

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0324616	7/1989	European Patent Office
0357336	3/1990	European Patent Office
0481704	4/1992	European Patent Office
0657548	6/1995	European Patent Office
9001065	2/1990	World Intellectual Property Organization
9212261	7/1992	World Intellectual Property Organization
9313223	7/1993	World Intellectual Property Organization
9513396	5/1995	World Intellectual Property Organization

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ART-UNIT: 164
PRIM-EXMR: W. Gary Jones
ASST-EXMR: Joyce Tung
LEGAL-REP: Baker & Botts, LLP

ABSTRACT:
An improved method allowing for rapid sensitive and standardized detection of a target nucleic acid from a pathogenic microorganism or virus or normal or abnormal gene in a sample is provided. The method involves hybridizing a target nucleic acid to several non-overlapping **oligonucleotide** probes that hybridize to adjacent regions in the target nucleic acid, the probes being referred to capture/amplification probes and amplification probes, respectively, in the presence of

paramagnetic beads coated with a ligand binding moiety. Through the binding of a ligand attached to one end of the capture/amplification probe and the specific hybridization of portions of the probes to adjacent sequences in the target nucleic acid, a complex comprising the target nucleic acid, the probes and the paramagnetic beads is formed. The probes may then ligated together to form a contiguous ligated amplification sequence bound to the beads, which complex may be denatured to remove the target nucleic acid and unligated probes. Alternatively, separate capture and amplification probes may be used which form continuous full-length or circular probes, and may be directly detected or amplified using a suitable amplification technique, e.g., PCR, RAM or HSAM for detection. The detection of the ligated amplification sequence, either directly or following amplification of the ligated amplification sequence, indicates the presence of the target nucleic acid in a sample. Methods for the detection of the ligated amplification sequence, including hybridization signal amplification method and ramification-extension amplification method, are also provided.

15 Claims, 21 Drawing Figures

EXMPL-CLAIM: 1

NO-PP-DRAWING: 13

PARENT-CASE:

BACKGROUND OF THE INVENTION

The present application is a continuation-in-part of pending International Application PCT/US95/07671 filed Jun. 14, 1995, and continuation0in-part of corresponding to pending U.S. application Ser. No. 08/596,331, filed May 20, 1996 which application is a continuation-in-part of U.S. application Ser. No. 08/263,937 filed June 22, 1994 now abandoned.

SUMMARY:

TECHNICAL FIELD

The present invention relates to assays and kits for carrying out said assays for the rapid, automated detection of infectious pathogenic agents and normal and abnormal genes.

BACKGROUND OF THE INVENTION

A number of techniques have been developed recently to meet the demands for rapid and accurate detection of infectious agents, such as viruses, bacteria and fungi, and detection of normal and abnormal genes. Such techniques, which generally involve the amplification and detection (and subsequent measurement) of minute amounts of target nucleic acids (either DNA or RNA) in a test sample, include inter alia the polymerase chain reaction (PCR) (Saiki, et al., Science 230:1350, 1985; Saiki et al., Science 239:487, 1988; PCR Technology, Henry A. Erlich, ed., Stockton Press, 1989; Patterson et al., Science 260:976, 1993), ligase chain reaction (LCR) (Barany, Proc. Natl. Acad. Sci. USA 88:189, 1991), **strand displacement** amplification (SDA) (Walker et al., Nucl. Acids Res. 20:1691, 1992), Q.beta. replicase amplification (Q.beta.RA) (Wu et al., Proc. Natl. Acad. Sci. USA 89:11769, 1992; Lomeli et al., Clin. Chem. 35:1826, 1989) and self-sustained replication (3SR) (Guatelli et al., Proc. Natl. Acad. Sci. USA 87:1874-1878, 1990). While all of these techniques are powerful tools for the detection and identification of minute amounts of a target nucleic acid in a sample, they all suffer from various problems, which have prevented their general applicability in the clinical laboratory setting for use in routine diagnostic techniques.

One of the most difficult problems is preparation of the target nucleic acid prior to carrying out its amplification and detection. This process is time and labor intensive and, thus, generally unsuitable for a

clinical setting, where rapid and accurate results are required. Another problem, especially for PCR and SDA, is that conditions for amplifying the target nucleic acid for subsequent detection and optional quantitation vary with each test, i.e., there are no constant conditions favoring test standardization. This latter problem is especially critical for the quantitation of a target nucleic acid by competitive PCR and for the simultaneous detection of multiple target nucleic acids.

Circumvention of the aforementioned problems would allow for development of rapid standardized assays, utilizing the various techniques mentioned above, that would be particularly useful in performing epidemiologic investigations, as well as in the clinical laboratory setting for detecting pathogenic microorganisms and viruses in a patient sample. Such microorganisms cause infectious diseases that represent a major threat to human health. The development of standardized and automated analytical techniques and kits therefor, based on rapid nd sensitive identification of target nucleic acids specific for an infectious disease agent would provide advantages over techniques involving immunologic or culture detection of bacteria and viruses.

Reagents may be designed to be specific for a particular organism or for a range of related organisms. These reagents could be utilized to directly assay microbial genes conferring resistance to various antibiotics and virulence factors resulting in disease. Development of rapid standardized analytical techniques will aid in the selection of the proper treatment.

In some cases, assays having a moderate degree of sensitivity (but high specificity) may suffice, e.g., in initial screening tests. In other cases, great sensitivity (as well as specificity) is required, e.g., the detection of the HIV genome in infected blood may require finding the virus nucleic acid sequences present in a sample of one part per 10 to 100,000 human genome equivalents (Harper et al., Proc. Nat'l. Acad. Sci., USA 83:772, 1986).

Blood contaminants, including inter alia, HIV, HTLV-I, hepatitis B and hepatitis C, represent a serious threat to transfusion patients and the development of routine diagnostic tests involving the nucleic acids of these agents for the rapid and sensitive detection of such agents would be of great benefit in the clinical diagnostic agree laboratory. For example, the HIV genome can be detected in a blood sample using PCR techniques, either as an RNA molecule representing the free viral particle or as a DNA molecule representing the integrated provirus (Ou et al, Science 239:295, 1988; Murakawa et al., DNA 7:287, 1988).

In addition, epidemiologic investigations using classical culturing techniques have indicated that disseminated Mycobacterium avium-intracellulaire (MAI) infection is a complication of late-stage Acquired Immunodeficiency Syndrome (AIDS) in children and adults. The precise extent of the problem is not clear, however, since current cultural methods for detecting mycobacteria are cumbersome, slow and of questionable sensitivity. Thus, it would be desirable and highly beneficial to devise a rapid, sensitive and specific technique for MAI detection in order to provide a definitive picture of the involvement in HIV-infected and other immunosuppressed individuals. Such studies must involve molecular biological methodologies, based on detection of a target nucleic acid, which have routinely been shown to be more sensitive than standard culture systems (Boddinghaus et al., J. Clin. Med. 28:1751, 1990).

Other applications for such techniques include detection and characterization of single gene genetic disorders in individuals and in populations (see, e.g., Landergren et al., Science 241: 1077, 1988 which discloses a ligation technique for detecting single gene defects, including point mutations). Such techniques should be capable of clearly distinguishing single nucleotide differences (point mutations) that can

result in disease (e.g., sickle cell anemia) as well as deleted or duplicated genetic sequences (e.g., thalassemia).

The methods referred to above are relatively complex procedures that, as noted, suffer from drawbacks making them difficult to use in the clinical diagnostic laboratory for routine diagnosis and epidemiological studies of infectious diseases and genetic abnormalities. All of the methods described involve amplification of the target nucleic acid to be detected. The extensive time and labor required for target nucleic acid preparation, as well as variability in amplification templates (e.g., the specific target nucleic acid whose detection is being measured) and conditions, render such procedures unsuitable for standardization and automation required in a clinical laboratory setting.

The present invention is directed to the development of rapid, sensitive assays useful for the detection and monitoring of pathogenic organisms, as well as the detection of abnormal genes in an individual. Moreover, the methodology of the present invention can be readily standardized and automated for use in the clinical laboratory setting.

SUMMARY OF THE INVENTION

An improved method, which allows for rapid, sensitive and standardized detection and quantitation of nucleic acids from pathogenic microorganisms from samples from patients with infectious diseases has now been developed. The improved methodology also allows for rapid and sensitive detection and quantitation of genetic variations in nucleic acids in samples from patients with genetic diseases or neoplasia.

This method provides several advantages over prior art methods. The method simplifies the target nucleic acid isolation procedure, which can be performed in microtubes, microchips or micro-well plates, if desired. The method allows for isolation, amplification and detection of nucleic acid sequences corresponding to the target nucleic acid of interest to be carried out in the same sample receptacle, e.g., tube or micro-well plate. The method also allows for standardization of conditions, because only a pair of generic amplification probes may be utilized in the present method for detecting a variety of target nucleic acids, thus allowing efficient multiplex amplification. The method also allows the direct detection of RNA by probe amplification without the need for DNA template production. The amplification probes, which in the method may be covalently joined end to end, form a contiguous ligated amplification sequence. The assembly of the amplifiable DNA by ligation increases specificity, and makes possible the detection of a single mutation in a target. This ligated amplification sequence, rather than the target nucleic acid, is either directly detected or amplified, allowing for substantially the same amplification conditions to be used for a variety of different infectious agents and, thus, leading to more controlled and consistent results being obtained. In addition, multiple infectious agents in a single sample may be detected using the multiplex amplification methodology disclosed.

Additional advantages of the present invention include the ability to automate the protocol of the method disclosed, which is important in performing routine assays, especially in the clinical laboratory and the ability of the method to utilize various nucleic acid amplification systems, e.g., polymerase chain reaction (PCR), **strand displacement** amplification (SDA), ligase chain reaction (LCR) and self-sustained sequence replication (3SR).

The present method incorporates magnetic separation techniques using paramagnetic particles or beads coated with a ligand binding moiety that recognizes and binds to a ligand on an **oligonucleotide** capture probe to isolate a target nucleic acid (DNA or RNA) from a sample of a clinical specimen containing e.g., a suspected pathogenic microorganism or gene abnormality, in order to facilitate detection of the underlying

disease-causing agent.

In one aspect of the present invention, a target nucleic acid is hybridized to a pair of non-overlapping **oligonucleotide** amplification probes in the presence of paramagnetic beads coated with a ligand binding moiety, e.g., streptavidin, to form a complex. These probes are referred to as a capture/amplification probe and an amplification probe, respectively. The capture/amplification probe contains a ligand, e.g., biotin, that is recognized by and binds to the ligand binding moiety on the paramagnetic beads. The probes are designed so that each contains generic sequences (i.e., not target nucleic acid specific) and specific sequences complementary to a nucleotide sequence in the target nucleic acid. The specific sequences of the probes are complementary to adjacent regions of the target nucleic acid, and thus do not overlap one another. Subsequently, the two probes are joined together using a ligating agent to form a contiguous ligated amplification sequence. The ligating agent may be an enzyme, e.g., DNA ligase or a chemical. Following washing and removal of unbound reactants and other materials in the sample, the detection of the target nucleic acid in the original sample is determined by detection of the ligated amplification sequence. The ligated amplification sequence may be directly detected if a sufficient amount (e.g., 10.sup.6 -10.sup.7 molecules) of target nucleic acid was present in the original sample. If an insufficient amount of target nucleic acid (<10.sup.6 molecule) was present in the sample, the ligated amplification sequence (not the target nucleic acid) may be amplified using suitable amplification techniques, e.g. PCR, for detection. Alternatively, capture and amplification functions may be performed by separate and independent probes. For example, two amplification probes may be ligated to form a contiguous sequence to be amplified. Unligated probes, as well as the target nucleic acid, are not amplified in this technique. Yet another alternative is a single amplification probe that hybridizes to the target such that its 3' and 5' ends are juxtaposed. The ends are then ligated by DNA ligase to form a covalently linked circular probe that can be identified by amplification.

DRAWING DESC:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a generic schematic diagram showing the various components used in the present method of capture, ligation-dependent amplification and detection of a target nucleic acid.

FIG. 2 is a schematic flow diagram generally showing the various steps in the present method.

FIG. 3 is an autoradiograph depicting the detection of a PCR amplified probe that detects HIV-1 RNA. Lane A is the ligated amplification sequence according to the invention; Lane B, which is a control, is PCR amplified nanovariant DNA, that does not contain any HIV-1-specific sequences.

FIG. 4 is a schematic diagram of an embodiment of the present invention showing the various components used for capture and ligation-dependent detection of a target nucleic acid, e.g. HCV RNA, and subsequent amplification of its sequences, employing two capture/amplification probes containing a bound biotin moiety and two ligation-dependent amplification probes.

FIG. 5 is a schematic flow diagram showing magnetic isolation, target specific ligation and PCR amplification for the detection of HCV RNA using a single capture/amplification probe and two amplification probes.

FIG. 6 is a schematic diagram showing the various components used to amplify and detect a target nucleic acid e.g. HCV RNA, employing two capture/amplification probes, each containing a bound biotin moiety, and

a single amplification probe.

FIG. 7 is a schematic diagram showing various components used to detect a target nucleic acid e.g. HCV RNA, employing two capture/amplification probes, each containing a bound biotin moiety, and a single amplification probe that circularizes upon hybridization to the target nucleic acid and ligation of free termini.

FIG. 8 is a photograph of ethidium bromide stained DNA depicting PCR amplified probes used to detect HCV RNA in a sample. The amount of HCV RNA in the sample is determined by comparing sample band densities to those of standard serial dilutions of HCV transcripts.

FIG. 9 is a photograph of ethidium bromide stained DNA depicting PCR amplified single, full length ligation-dependent and circularizable probes used to detect HCV RNA in a sample. The amount of HCV RNA in the sample is determined by comparing sample band densities to those of standard serial dilutions of HCV transcripts.

FIG. 10 is a schematic diagram illustrating the capture and detection of a target nucleic acid by the hybridization signal amplification method (HSAM).

FIG. 11 is a schematic diagram illustrating the use of HSAM to detect an antigen with a biotinylated antibody and biotinylated signal probes.

FIGS. 12A and 12B are schematic diagrams illustrating RNA-protein crosslinks formed during formalin fixation. FIG. 12A depicts the prevention of primer extension due to the crosslinks in the method of reverse **transcription** PCR (RT-PCR). FIG. 13B illustrates that hybridization and ligation of the probes of the present invention are not prevented by protein-RNA crosslinks.

FIG. 13 is a schematic diagram of multiplex PCR. Two set of capture/amplification probes, having specificity for HIV-1 and HCV, respectively, are used for target capture, but only one pair of generic PCR primers is used to amplify the ligated probes. The presence of each target can be determined by the size of the amplified product or by enzyme-linked immunosorbent assay.

FIG. 14 is a schematic diagram of HSAM using a circular target probe and three circular signal probes. AB, CD and EF indicate nucleotide sequences in the linker regions that are complementary to the 3' and 5' nucleotide sequences of a circular signal probe. AB', CD' and EF' indicate the 3' and 5' nucleotide sequences of the signal probes that have been juxtaposed by binding to the complementary sequences of the linker regions of another circular signal probe.

FIG. 15 is a schematic diagram of HSAM utilizing a circular target probe and linear signal probes.

FIG. 16 is a schematic diagram of amplification of a circularized probe by primer-extension/displacement and PCR.

FIG. 17 is a schematic diagram of an embodiment of RAM in which a T3 promoter has been incorporated into Ext-primer 2, allowing amplification of the circular probe by **transcription**.

FIG. 18 provides a polyacrylamide gel depicting the amplification of a circular probe by extension of Ext-primer 1.

FIG. 19 is a schematic diagram of amplification of a circularized probe by the ramification-extension amplification method (RAM).

FIG. 20 is a diagram of a RAM assay in which an RNA polymerase promoter sequence is incorporated into the primer.

DETDESC:

DETAILED DESCRIPTION OF THE INVENTION

The present invention is directed towards simplified sample preparation and generic amplification systems for use in clinical assays to detect and monitor pathogenic microorganisms in a test sample, as well as to detect abnormal genes in an individual. Generic amplification systems are described for clinical use that combine magnetic separation techniques with ligation/amplification techniques for detecting and measuring nucleic acids in a sample. The separation techniques may be combined with most amplification systems, including inter alia, PCR, LCR and SDA amplification techniques. The present invention further provides alternative amplification systems referred to as ramification-extension amplification method (RAM) and hybridization signal amplification (HSAM) that are useful in the method of the present invention. The advantages of the present invention include (1) suitability for clinical laboratory settings, (2) ability to obtain controlled and consistent (standardizable) results, (3) ability to quantitate nucleic acids in a particular sample, (4) ability to simultaneously detect and quantitate multiple target nucleic acids in a test sample, (5) ability to sensitively and efficiently detect nucleic acids in serum samples and in situ, and (6) ability to detect a single mutation in a target. Moreover, the complete protocol of the presently disclosed method may be easily automated, making it useful for routine diagnostic testing in a clinical laboratory setting. With the use of RAM and HSAM, an isothermal amplification can be achieved.

The present invention incorporates magnetic separation, utilizing paramagnetic particles, beads or spheres that have been coated with a ligand binding moiety that recognizes and binds to ligand present on an **oligonucleotide** capture probe, described below, to isolate a target nucleic acid (DNA or RNA) from a clinical sample in order to facilitate its detection.

Magnetic separation is a system that uses paramagnetic particles or beads coated with a ligand binding moiety to isolate a target nucleic acid (RNA or DNA) (Lomeli et al. Clin. Chem. 35:1826, 1989) from a sample. The principle underscoring this method is one of hybrid formation between a capture probe containing a ligand, and a target nucleic acid through the specific complementary sequence between the probe and target. Hybridization is carried out in the presence of a suitable chaotropic agent, e.g., guanidine thiocyanate (GnSCN) which facilitates the specific binding of the probe to complementary sequences in the target nucleic acid. The hybrid so formed is then captured on the paramagnetic bead through specific binding of the ligand on the capture probe to the ligand binding moiety on the bead.

The term "ligand" as used herein refers to any component that has an affinity for another component termed here as "ligand binding moiety." The binding of the ligand to the ligand binding moiety forms an affinity pair between the two components. For example, such affinity pairs include, inter alia, biotin with avidin/streptavidin, antigens or haptens with antibodies, heavy metal derivatives with thiogroups, various polynucleotides such as homopolynucleotides as poly dG with poly dC, poly dA with poly dT and poly dA with poly U. Any component pairs with strong affinity for each other can be used as the affinity pair, ligand--ligand binding moiety. Suitable affinity pairs are also found among ligands and conjugates used in immunological methods. The preferred ligand-ligand binding moiety for use in the present invention is the biotin/streptavidin affinity pair.

In one aspect, the present invention provides for the capture and detection of a target nucleic acid as depicted in FIG. 1, which provides a schematic depiction of the capture and detection of a target nucleic